Sanitary Survey Report

Kaka
PWSID No. 0400037

Survey Conducted on March 22, 2016

Survey Conducted for the
Environmental Protection Agency
Region 9

Sanitary Survey Conducted
by

Denver Fraser, P.E.
Sleeping Giant Environmental Consultants, LLP

for

Emmanuelle Rapicavoli
USEPA Environmental Engineer

Sanitary Survey Contents Page

Kaka
(PWSID No. 0400037)

I. Narrative Report

Sanitary Survey

Kaka
PWSID No. 0400037
Survey Performed March 22, 2016

A. Introduction

On March 22, 2016, Denver Fraser, P.E., of Sleeping Giant Environmental Consultants, LLP (SGEC), conducted a sanitary survey of the Kaka Public Water System (PWS). Emmanuelle Rapicavoli, with EPA Region 9, also assisted with the survey. Vernetto Ramon, with the Tohono O'odham Utility Authority (TOUA), represented the system and provided on-site assistance with the survey. Myrt McIntyre, Manager of the TOUA Water/Wastewater & Propane Department also assisted with the survey. Pablo Figueroa and Nick Silides with Rural Community Assistance Corporation (RCAC) were on site for the survey. Additionally, Darron Clark, with Indian Health Service (IHS), also assisted with the survey.

The Kaka PWS is on the Tohono O'odham Reservation and is located approximately 21 miles northwest of Sells, AZ, on State Highway 86; 13 miles north on BIA Route 15; 12 miles east on BIA Route 34; and nine miles northwest on BIA Route 23.

The Kaka PWS consists of two wells, each with a chlorination unit, and one storage tank. Information provided by TOUA indicates that there are 32 active residential and two non-residential service connections serving approximately 138 people on this system. The Kaka PWS is classified as a community system because it serves more than 25 of the same people daily on a year-round basis. As a community PWS, Kaka is regulated for contaminants that have detrimental health effects over both a short-term (acute) and long-term (chronic) basis.

The sanitary survey site visit was conducted by SGEC on behalf of the U.S. Environmental Protection Agency (USEPA) Safe Drinking Water Act (SDWA) and regulations regarding public water supplies contained in *40 CFR Part 141 – National Primary Drinking Water Regulations* as they apply to most of the PWSs on Tribal lands in Region 9. Regular sanitary surveys of PWSs are an important component of EPA Region 9's implementation program and are critical for protection of the health of PWS water users.

Sanitary surveys are comprehensive evaluations of a PWS's physical components as well as management and operation. Sanitary surveys have an on-site component in which above-ground facilities are inspected, records are obtained

and reviewed, and operators and managers are interviewed. PWS components evaluated typically include:

1. Source(s).
2. Treatment.
3. Storage.
4. Pumping facilities.
5. Operator compliance with training and certification requirements.
6. Management and operations.
7. Distribution system (including cross connection control).
8. Monitoring, reporting and data verification.

During the sanitary survey, the eight components listed above are evaluated to determine if appropriate barriers are in place for protection of the users' health. Where they are not, the risk to public health is assessed, deficiencies are found, and recommendations for correction are made. Where public health risks are serious, boil orders may be imposed and enforcement actions may be initiated to ensure corrective actions are taken in a timely manner. Sanitary surveys are normally conducted once every three to five years.

B. Sources

Kaka is served by two wells. Each well has its own chlorination unit. Both wells may come to a common header prior to the first customer, but it is not clear from the available plan sheets whether this is true. If there is a common header prior to the first customer, a sample station would allow single entry point sampling for the two wells.

Well 1—GW001 (Photos 2-3). This well is located within a locked fenced area adjacent to a local road on the northwest side of the Kaka service area. The well is located within the same fenced area as the chlorination unit for Well 1. The well information provided by TOUA indicates the well was constructed in 1977. The well was drilled to a depth of 700 feet and an 8-inch steel casing was installed (the casing depth is not noted on the well log). The as-built well detail indicates a static water level of 635 feet. A grout seal was not indicated in the well information. The well is equipped with a 10-HP submersible pump that produces approximately 30 gallons per minute (gpm). The well pumps operate together based on SCADA controls at Storage Tank 1.

The well cap consists of a gasketed sanitary seal well cap that is properly vented. Appurtenances on the well discharge piping include a pressure relief valve, a raw water sample tap, a water meter, and a pressure gauge. There is no treated water sample tap.

Well 2—GW002 (Photos 5-7). This well is located within a locked fenced area approximately 350 feet west of Well 1. The well log indicates the well was constructed on January 14, 2000; however, the well was not made operational until 2008. The well was drilled and cased to a depth of 756 feet. A grout seal was not indicated on

the well log. A *Well Information and Pump Test Report* completed in August of 2001, indicates a static water level of 628 feet and a pumping water level of 631 feet at a pumping rate of 110 gpm. The well is equipped with a 20-HP submersible pump rated at 85 gpm at 720 feet total dynamic head (the well flow meter indicates the well produces approximately 70 gpm). The well pumps operate together based on SCADA controls at Storage Tank 1.

The wellhead is equipped with a properly vented sanitary seal well cap. Appurtenances on the well discharge piping include a raw water sample tap, pressure relief valve, pressure gauge, blowoff line, water meter, and a treated water sample tap.

C. Treatment

Chlorination Unit for Well 1—TP001 (Photos 2 and 4). Treatment for Well 1 consists of chlorination with sodium hypochlorite. The NSF-certified sodium hypochlorite is diluted and injected in the well's discharge piping with a ProMinent ConceptPlus positive displacement pump with a capacity of 0.26 gph.

Chlorination Unit for Well 2—TP002 (Photos 5, 6, and 8). Treatment for Well 2 consists of chlorination with sodium hypochlorite. The NSF-certified sodium hypochlorite is diluted and injected in the well's discharge piping with a ProMinent ConceptPlus positive displacement pump with a capacity of 1.03 gph.

D. Finished Water Storage

Storage Tank 1—ST001 (Photos 9-16). A 20,000-gallon welded steel tank provides storage for the PWS. The tank is located within a locked fenced area approximately 2,300 feet northwest of the Well 1 location. The tank was constructed in 1985.

The tank sits on a gravel foundation with a retaining ring. The outlet of the overflow line is screened and terminates at an adequate distance above the ground. A splash pad is provided.

The tank ladder is equipped with a cage. The cage opening is not equipped with a locking cover, but the ladder is equipped with a locking cover. The access hatch fits with an overlap and is gasketed; however, the gasket had come unglued at one part of the riser and was no longer providing a seal. The surveyor was able to fit the gasket back in place and close the hatch, but the seal should be re-glued. The hatch is locked. There is a thin layer of fine sediment on the bottom of the tank.

The vent is equipped with an insect screen; however, the screen appears torn at the top (Photo 12). A shroud cover on the vent protects the vent opening against wind-blown dust.

The water level target mechanism was working at the time of the sanitary survey. The conduit opening for the sight gauge cable is small and should prevent the entry of insects and other contaminants into the tank.

E. Distribution System

The distribution mains for Kaka are mostly 2-, 3-, and 4-inch PVC pipe. There is a small amount of 1-inch polyethylene piping primarily used for service connection lines. The mains were installed around 1977 and are reportedly in reasonably good condition. There is conflicting information on the lengths of distribution mains installed for this community. The sanitary survey form accompanying this report provides further discussion on the distribution mains. A pressure reading taken at a home in the community showed a pressure of approximately 30 pounds per square inch (Photo 16). A chlorine residual taken at the same location showed 0.33 mg/L (Photo 16).

F. Monitoring, Reporting, and Data Verification

The TOUA laboratory department has developed a Water Quality Control Laboratory 2015 Sampling Plan – April 2015. This report has been updated for 2016 and is presently in the review process. This document outlines procedures to be followed for sample collection, handling, and chain of custody. Each TOUA public water supply is identified in the plan, and each public water supply sampling plan has been submitted to USEPA Region 9 for approval.

The TOUA has developed four sampling routes: east, north, south and west. Previously, the routing schedule identified a sample rotation for the system but did not specifically identify a sampling site. The water quality technician (sample collector) would then collect a sample within the scheduled area from a site that is available. Vernetto Ramon is presently working to identify sample sites by housing location numbers and locating these sites on Google Earth and TOUA village maps. The bacteriological samples will then be obtained from different approved sites for each system each month, as required by the Revised Total Coliform Rule (RTCR).

At a joint TOUA, IHS, EPA, and RCAC meeting on March 22, 2016, sampling and sample plans for TOUA was a topic of discussion. EPA presented TOUA with a template of a Comprehensive Sample Site Plan (CSSP). A properly developed CSSP will address the sample requirements for the RTCR, Ground Water Rule (GWR), Lead and Copper Rule (LCR), and the Disinfectants/Disinfection Byproduct Rule (D/DBPR). It was also discussed that RCAC could be used to assist TOUA with the development of CSSPs for their PWSs.

Monitoring compliance was not part of the field sanitary survey. However, Emmanuelle Rapicavoli, USEPA Region 9 environmental engineer, will be working with TOUA for all monitoring, reporting, and data verification requirements for their systems and sample sites. Entry point samples for Kaka system are obtained from each of the wells. However, there is no sample tap following the point of chlorination

for Well 1, so only raw water can be sampled. If the two wells come to a common header prior to going to the first customer, a sample station could be installed to allow single entry point samples. However, it is not clear from the available drawings if there is a common header.

G. Management and Operations

The TOUA operates under a resolution of the Tohono O'odham Legislative Council. The Tohono O'odham Legislative Council established a Management Board that oversees the operation of the TOUA under authority of the Second Restated Plan of Operation (5/22/1991). Among other things, the TOUA was organized "to acquire, construct, operate, maintain, promote, and expand utility systems furnishing electric, gas, water, sewer, and telephone services within the Tohono O'odham Nation."

The Water/Wastewater Department is one of six departments within the TOUA. This department oversees all public water systems within the Tohono O'odham Nation. The department positions are identified on the organizational chart below (see Figure 1). There have been 52 public water systems within the Tohono O'odham Nation, but due to consolidation and interties, the number has been reduced to 32.

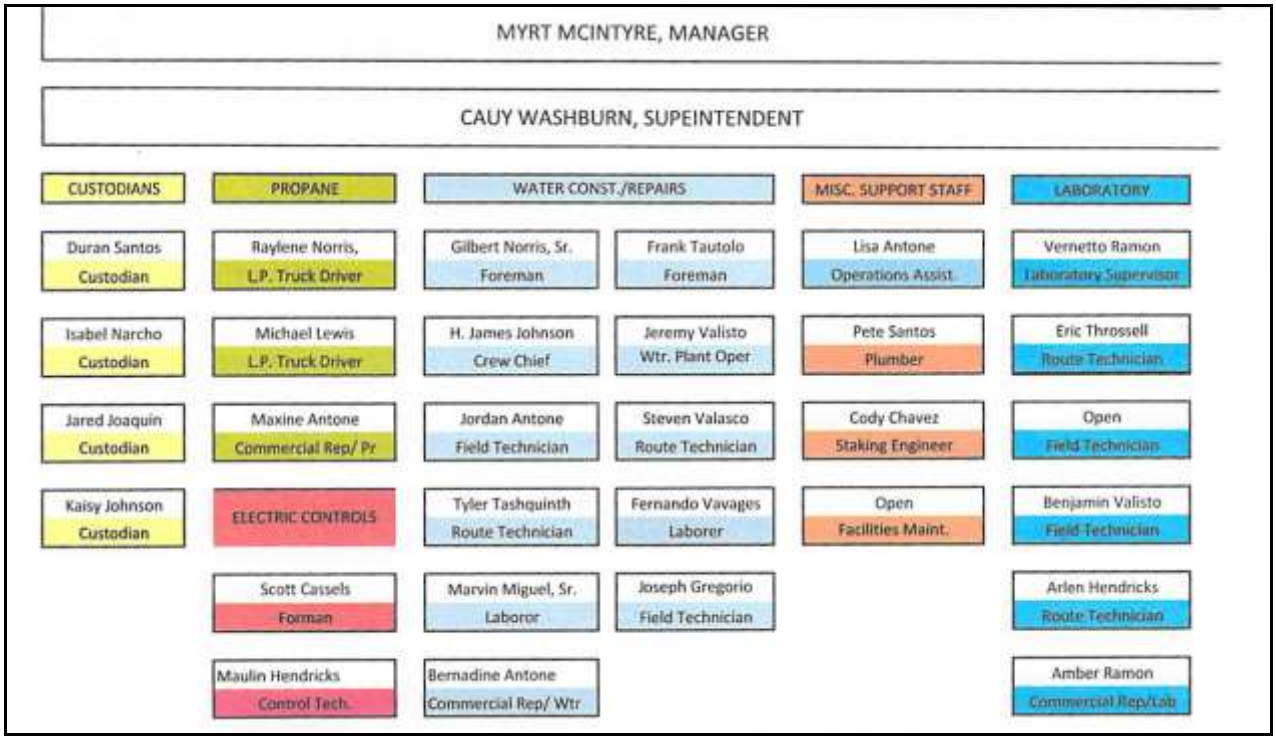

Figure 1: TOUA Organizational Chart

The TOUA has numerous rate classes for water and wastewater services. A typical residential service pays a fixed charge of $35.59 per month, with an increasing block rate ranging from $3.16 per 1,000 gallons for the first 2,000 gallons to $4.56 per 1,000

gallons for use in excess of 30,000 gallons. Commercial rates are based on meter size, also with an increasing block rate The accompanying sanitary survey form includes the updated metered water and sewer service schedule as of January 1, 2016. The TOUA reported that they have an excellent collection rate. The TOUA has a shut-off policy for delinquent accounts, a penalty charge, and a re-connection fee. There were no indications of budget shortfalls, and TOUA personnel reported that there are no problems associated with inadequate funding.

The TOUA has a safety program that includes confined space entry, lock-out/tag-out, and excavation safety, as well as other standard safety policies. Storage tank ladders are equipped with safety cages and/or safety cables. Randy Cook was hired as safety officer for TOUA in early 2015. Vernetto Ramon is presently working on a safety plan for the Water & Wastewater Department.

A radio telemetry SCADA system at the TOUA office in Sells, AZ, monitors operation of most of the water systems. The on/off status of the wells and the water level in the storage tanks are monitored and recorded in Sells. The wells and booster pumps at these telemetered systems can be operated with the SCADA system from the office in Sells. Well operation and storage tank level information are telemetered from the Kaka system to the TOUA office in Sells.

H. Operator Compliance

The TOUA has seven individuals who have water treatment and/or water distribution operator certification (Page 18 of form in Section II). Myrt McIntyre, Water/Wastewater and Propane Manager, is a Water Treatment Grade 3 and Water Distribution Grade 3 by the Arizona Department of Environmental Quality. Vernetto Ramon, Lab Supervisor, is certified Level 1 Distribution and Level 1 Treatment by the Inter Tribal Council of Arizona, Inc., (ITCA). These two individuals oversee the water distribution and treatment operations, water quality sampling, and water quality monitoring for TOUA.

I. Deficiencies and Recommendations for Kaka

Following is a list of deficiencies and recommendations for the system based on information gathered during the sanitary survey. Each deficiency is ranked in order of severity and is assigned a **Health Risk Priority** number.

Deficiencies assigned a **Health Risk Priority 1** are deficiencies that present a serious health risk. Health Risk Priority 1 deficiencies should be corrected immediately.

Deficiencies assigned a **Health Risk Priority 2** are deficiencies that present a critical system defect, critical operational defect, or potential health hazard. Health Risk Priority 2 deficiencies should be corrected as soon as possible.

Deficiencies assigned a **Health Risk Priority 3** are deficiencies that present a critical system defect, critical operational defect, or potential health hazard, but are not as

significant as Health Risk Priority 2. Health Risk Priority 3 deficiencies should be corrected as workload allows.

Deficiencies assigned a **Health Risk Priority 4** are deficiencies that present a system defect, operational defect, or potential contamination hazard and are costly to correct. Health Risk Priority 4 deficiencies should be addressed in any long-range water system improvement project.

Deficiencies assigned a **Health Risk Priority 0** are suggestions for improvement, though not a health risk.

1. **Storage Tank 1 Vent Screen – Health Risk Priority 2** *(ST001 – Code ST1):* The vent screen on the tank appears torn at the top (Photo 12).

   Recommendation: The insect screen on the vent should be replaced to prevent entry of insects and other contaminants.

2. **Storage Tank 1 Access Hatch Gasket – Health Risk Priority 2** *(ST001 – Code ST1):* The gasket between the storage tank riser and access hatch has come unglued and was not providing an adequate seal (Photo 13). The unglued portion of the gasket was placed between the riser and hatch when it was closed, but it will come off whenever the hatch is opened.

   Recommendation: The access hatch gasket should be re-glued or replaced to form a tight seal between the hatch and riser. This will prevent entry of insects and other contaminants into the tank through any potential openings between the hatch and riser.

3. **Entry Point Sample Station or Finished Water Sample Tap – Health Risk Priority 2** *(Code MR2):* It is believed there is common header piping between the two wells prior to going to the distribution system piping and the first customer; however, it is not clear from the plan sheets available for review that this is the case. There is no dedicated sample tap following treatment at Well 1. Regulations require that entry point samples be taken following treatment and prior to the first customer.

   Recommendation: The piping between the two wells should be investigated and if there is a common header, a sample station with a smooth-nosed tap should be installed at a location that is downstream of the point where the flows from the two wells combine (common header) but prior to the first customer. This tap will serve as the entry point to the distribution system. It is also recommended that a sample tap be installed in the discharge piping following treatment for Well 1 to allow for individual treated water sampling of Well 1 and proper entry point sampling if necessary.

4. **Storage Tank 1 Cleaning – Health Risk Priority 3** *(ST001 – Code ST4):* There is a thin layer of sediment on the floor of Storage Tank 1 and some corrosion on the interior of the tank (Photo 14).

Recommendation: It is recommended that TOUA consider a cleaning and inspection program for all TOUA storage tanks. There is visible sediment on the floor of Storage Tank 1. Previously, TOUA has had robotic cleaning performed on storage tanks. Robotic cleaning is most effective and economical when the sediment level is between ¼- to ½-inch thick.

5. **Comprehensive Sample Site Plans (CSSP) – Health Risk Priority 3** *(MR2):* The Revised Total Coliform Rule (RTCR) requires all PWSs to collect coliform samples according to a written sample siting plan. This plan ensures that samples are representative of the entire distribution system. While TOUA develops an annual Water Quality Control Laboratory Sampling Plan for their PWSs, these plans do not identify specific sampling sites that TOUA will be using each month. In addition to total coliform sites, the CSSP should also identify sample sites for compliance with the Ground Water Rule (GWR), Lead and Copper Rule (LCR), and the Disinfectants/Disinfection Byproducts Rule (D/DBPR).

   Recommendation: At the joint TOUA, IHS, EPA, and RCAC meeting in March 2016, EPA presented TOUA with a template CSSP that would comply with the requirements of the RTCR, GWR, LCR and D/DBPR. At that meeting RCAC confirmed that they were available to assist TOUA in developing these plans for each of their PWSs. It is understood that TOUA is currently working to identify their sampling sites by housing location numbers and to locate these sites on Google Earth and/or TOUA village maps. However, it is recommended that TOUA consider using RCAC to assist in the development of CSSPs for each of their water systems. RCAC has personnel who are experienced in the development of CSSPs and can offer valuable assistance at no cost to TOUA. Once the plans are developed, the CSSPs need to be submitted to the USEPA Region 9 program manager for approval. The approved CSSPs need to be used to ensure proper sample collection.

II. Sanitary Survey Form, Scanned Information Provided from System, and Schematics

III. Photographs